



Hall's UIC wells, Ritchie County

Thursday, May 26, 2016 2:40 PM

Subject	Hall's UIC wells, Ritchie County
From	Friends of the Hughes Watershed
To	Aquino, Marcos
Cc	Jim Shreves
Sent	Monday, November 16, 2015 2:49 PM
Attachments	<div> Hall UIC 9-19-15_...</div> <div> Hall's UIC 2015 Insp...</div>

Attached is 2 documents.

One document is an inspection done at the UIC site in 2014. This inspection contains the permit conditions. Please pay particular attention to Condition #4.

The other document contains the Order issued by the WV DEP Office of Oil and Gas.

Feel free to call or email with any questions.

Thank You

Vickie

for Jim Shreves

State of West Virginia
Department of Environmental Protection
Office of Oil and Gas

Complaint Information Form

1. Date and time complaint taken: 7/24/2015 0955 Reply Due _____
2. Person taking complaint: Lonnie Mills
3. Person reporting complaint: Name: Jim Shreves

Phone No.: (H) (b) (6)(b) (6) (C)
Best time to return call:

4. Company/person complaint is against / API#, Well Number, Farm Name, Etc:
Antero, Hall Injection Well and Greenhunter Injection Well

- a. Have they been contacted? ☐ Yes ☐ No.
b. County: Ritchie

5. What are the specific directions to the site?

6. Complaint in detail: Mr. Shreves is calling on behalf of "Friends of the Hughes" and they believe the formationed injection wells have contaminated nearby waters of the state. They have collected samples and would like DEP to set up monitoring on these wells.

7. Does this complaint involve dust issues? ☐ Yes ☒ No.
☐ Well Pad ☐ Access Road ☐ Public Road ☐ Other _____

8. Inspector Assigned: Dave Cowan

9. Inspectors remarks:

- See Tom Bass report from 8-6-2015

Oil and Gas Privacy Notice

The Office of Oil and Gas processes your personal information, such as name, address and phone number, as a part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use of your personal information, please contact DEP's Chief Privacy Officer at deprivacyofficer@wv.gov.

Mills, Lonnie R

Subject: FW: ness pad

From: James Shreves (b) (6)(b) (6)(b) (6)(b) (6)

Sent: Friday, July 24, 2015 1:15 PM

To: Mills, Lonnie R

Subject: Re: ness pad

Nick has more updated info then we do, but the water well of Richard Blour conductivity was 765, TDS 538, salinity 373, we done a basic grab sample on their well that day we will get the info to you when we get it but the baseline test on these wells are in the permit and we feel they should be tested now and at least once a year everyone we talk to says their water has changed. the results for the ground water monitoring wells DEP has these, they should be gone over And when the green hunter inspection is done the well they have been having communication with and trying to plug should be part of this inspection also it is a conventional well so the people around it should be taken in consideration for water testing too thanks Jim

On Friday, July 24, 2015 10:05 AM, "Mills, Lonnie R" <Lonnie.R.Mills@wv.gov> wrote:

Jim,
I've opened a complaint regarding the Halls and Greenhunter. If the Friends of the Hughes would be willing to submit their data to us, we would greatly appreciate it. The more knowledge we have on the extent and impact, the better our position will be. I've also sent an email to Nick, I think he's in the field today but I hope to hear back from him shortly.

Thanks,

LonnieMills

Environmental Resource Specialist 3

WVDEP- Office of Oil and Gas

601 57th Street SE

Charleston WV 25304

Lonnie.R.Mills@wv.gov

(304)926-0499 Ext 1036



west virginia department of environmental protection

Office of Oil and Gas
601 57th Street, S.E.
Charleston, WV 25304
(304) 926-0450

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dcp.wv.gov

MEMORANDUM

To: File

From: Thomas L. Bass *TJB*

Date: August 6, 2015

Subject: August 4, 2015 Site visit to Hall Drilling UIC 2D0859669 facility.

A call was received by the Office of Oil and Gas stating there was increased Bromide levels in Hershers run downstream of the UIC facility. Based on this call sample containers were order from REIC laboratories. Upon receipt Gene Smith, Jackie Thornton and Thomas L. Bass traveled to the facility.

Upon arrival at the office of Hall Drilling we met with Mike and Jason Hall. We looked over the latest round of monitoring well data submitted by their environmental contractor. Monitoring well #3 had a chloride hit above the secondary drinking water criteria. However, after looking at the field parameters it appeared there was either an issue with the well or sample collection. During sample collection the groundwater temperature was raising indicating improper purge or an influence of surface water. Mr. Hall mentioned that the well would be resampled, following the appropriate purge protocol and that Bromide would be included in the analytical suite.

We then proceeded to the stream to collect surface water samples. We parked adjacent to the highway and a trailer park. We examined the area and identified raw sewage coming from the trailer park. The stream had no flowing water at this time, therefore no samples were collected. It was determined, once there is a rain event significant enough to induce surface water flow in the stream, we will return to collect samples.

We then proceeded to the UIC facility. An examination of monitoring well #3 identified a potential issue with the surface seal.



Surface seal monitoring well #3

The area around and adjacent to monitoring well #3 did not indicate signs of stressed vegetation, oil or sheens.

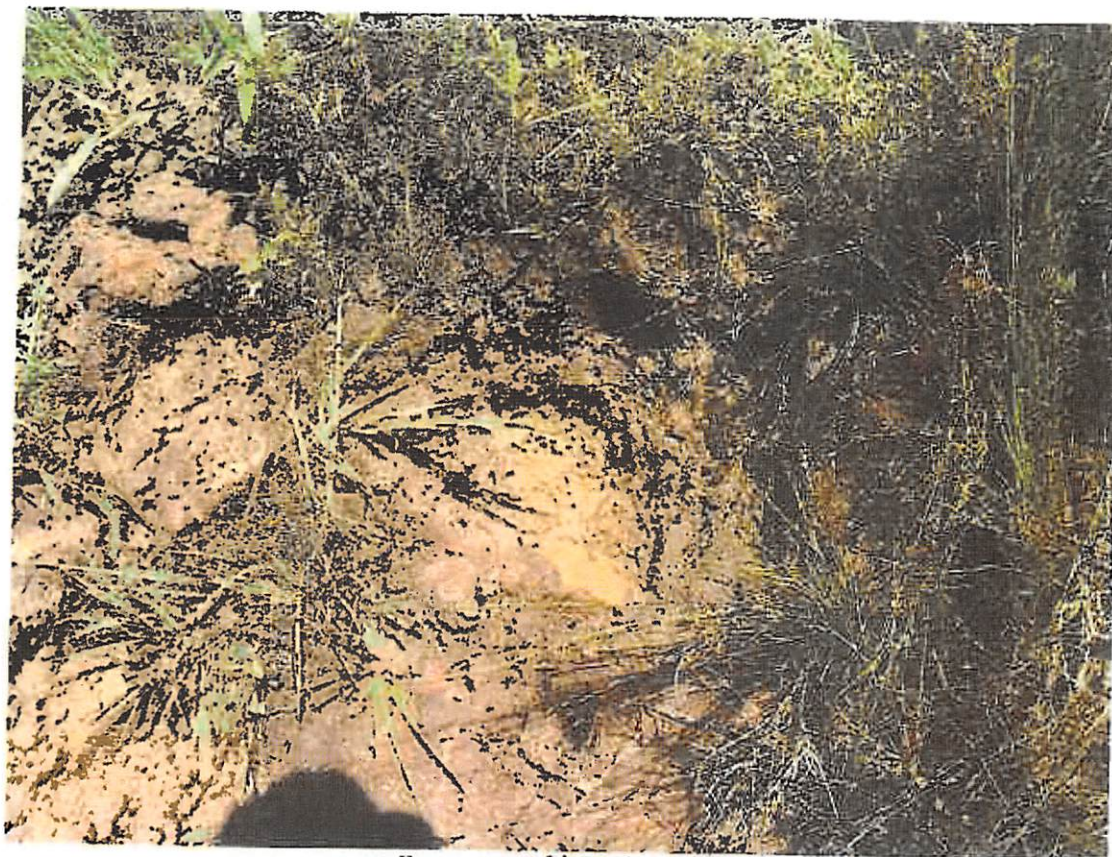


Monitoring well #3



Down slope of monitoring well #3

A spring was identified adjacent to monitoring well #3. A sump was created for a future sample point.



Sump created in spring area

Figure 2

Hall Drilling, LLC
Ellenboro, Richie County, West Virginia
UIC Permit 2D0859669

Summary of Analytical Results

					Radiologics (1)		Metals (2)											Conventional Chemistry Parameters (2)													Field Measurements		
Sample Name	Lab ID No.	Type	Sampled By	Date Sampled	Ra-226	Ra-228	Al	Ba	Ca	Fe	Mg	Mn	K	Na	Sr	As	Pb	Chloride	Bromide	Nitrate	Nitrite	TDS	TSS	SO4	Sp Cond (3)	pH (4)	Hardness	Acidity	Alkalinity	Sp Cond (3)	pH (4)	Temp (5)	
Sample 1 (Downstream)	1509E14-01A	Liquid - Grab	WVDEP-REIC	9/11/2015	6.15	5.78	2.90	0.132	38.6	3.98	6 92	0.151	4.64	13.8	0.286	0.0022	0 003	20.6	ND	0.63	1.08	168	98 0	18.1	335	7.48	125	17.6	96.5	300	6.93	20.43	
Sample 2 (upstream of center tributary)	1509E14-02A	Liquid - Grab	WVDEP-REIC	9/11/2015	5.32	6 86	2.68	0.11	33.7	3.60	6 25	0.133	4.65	13.3	0.231	0.0019	0.0024	17.6	ND	0.56	1.05	164	55 0	14.9	312	7.28	110	14.2	91.8	285	6.82	20.59	
Sample 3 (center trib at gatehouse)	1509E14-03A	Liquid - Grab	WVDEP-REIC	9/11/2015	5.78	6.14	0.731	0.153	67.0	0.938	12.3	0.147	3.90	19.3	0.763	ND	0.0009	47.3	0.24	1.09	1.35	286	29 0	43.3	572	7.86	218	2.1	138	520	7.16	19.9	
Sample 4 (seep below MW-3)	1509E14-04A	Liquid - Grab	WVDEP-REIC	9/11/2015	4.72	5 35	1.40	1.34	173	1.23	55.9	13.8	8.61	350	15 3	ND	0.0023	938	12.5	2.76	ND	###	116	5.24	3,270	4.02	661	73.2	ND	2,751	5.86	22.01	
Sample 5 (upstream of east tributary)	1509E14-05A	Liquid - Grab	WVDEP-REIC	9/11/2015	5.61	6.68	1.06	0.080	42.6	1.46	7.46	0 070	4.99	18.2	0.200	0.0025	0.0021	25.2	ND	0.58	1.26	193	18 0	16.0	399	7.35	137	2.4	119	404	7.01	20.04	

- Notes:
- (1) pCi/L
 - (2) mg/L
 - (3) umhos/cm
 - (4) Standard Units
 - (5) Celsius



Improving the environment, one client at a time...

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Westover, WV 26501
TEL: 304.241.5861

Wednesday, September 30, 2015

TOM BASS
WEST VIRGINIA DEP / OFFICE OF OIL & GAS
601 57TH STREET
CHARLESTON, WV 25304

TEL: (304) 926-0450
FAX:

RE: STEAMS & DRAINS

Work Order #: 1509E14

Dear TOM BASS:

Stacy Heasley
Project Manager



Client: WEST VIRGINIA DEP / OFFICE OF OIL & GAS**Project:** STEAMS & DRAINS

The analytical results presented in this report were produced using documented laboratory SOPs that incorporate appropriate quality control procedures as described in the applicable methods. Verification of required sample preservation (as required) is recorded on associated laboratory logs. Any deviation from compliance or method modification is identified within the body of this report by a qualifier footnote which is defined at the bottom of this page.

All sample results for solid samples are reported on an "as-received" wet weight basis unless otherwise noted.

Results reported for sums of individual parameters, such as TTHM and HAA5, may vary slightly from the sum of the individual parameter results, due to rounding of individual results, as required by EPA.

The test results in this report meet all NELAP and/or VELAP requirements for parameters clearly designated as PA, VA, PA/VA, or VELAP in the column labeled NELAP.

Please note if the sample collection time is not provided on the Chain of Custody, the default recording will be 0:00:00. This may cause some tests to be apparently analyzed out of hold.

All tests performed by REIC Service Centers are designated by an annotation on the test code. All other tests were performed by REIC's Main Laboratory in Beaver, WV.

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DEFINITIONS:

MCL: Maximum Contaminant Level

MDL: Method Detection Limit; The lowest concentration of analyte that can be detected by the method in the applicable matrix.

Mg/Kg or mg/L: Units of part per million (PPM) - milligram per Kilogram (weight/weight) or milligram per Liter (weight/volume).

NA: Not Applicable

ND: Not Detected at the PQL or MDL

PQL: Practical Quantitation Limit; The lowest verified limit to which data is quantified without qualifications. Analyte concentrations below PQL are reported either as ND or as a number with a "J" qualifier.

Qual: Qualifier that applies to the analyte reported.

TIC: Tentatively Identified Compound, Estimated Concentration denoted by "J" qualifier.

Ug/Kg or ug/L: Units of part per billion (PPB) - microgram per kilogram (weight/weight) or microgram per liter (weight/volume).

QUALIFIERS:

X: Reported value exceeds required MCL

B: Analyte detected in the associated Method Blank at a concentration > 1/2 the PQL

E: The sample result is within the method accepted Linear Dynamic Range determined by the lab for this analysis. However, it may be considered estimated when applying the TNI (The NELAC Institute) standard.

H: Holding time for preparation or analysis has been exceeded.

J: Analyte concentration is reported, and is less than the PQL and greater than or equal to the MDL. The result reported is an estimate.

S: % REC (% recovery) exceeds control limits

CERTIFICATIONS:

Beaver, WV: WVDHHR 00412CM, WVDEP 060, VADCLS 00281, KYDEP 90039, TNDEQ TN02926, NCDWQ 466, PADEP 68-00839, VADCLS (VELAP) 460148

Bioassay (Beaver, WV): WVDEP 060, VADCLS(VELAP) 460148, PADEP 68-00839

Roanoke, VA: VADCLS(VELAP) 460150

Verona, VA: VADCLS(VELAP) 460151

Ashland, KY: KYDEP 00094, WVDEP 389

Morgantown, WV: WVDHHR 003112M, WVDEP 387

REI Consultants, Inc. - Analytical Report

WO#: 1509E14

Date Reported: 9/30/2015

Client:	WEST VIRGINIA DEP / OFFICE OF OIL & GAS	Collection Date:	9/10/2015 10:35:00 AM
Project:	STEAMS & DRAINS	Date Received:	9/11/2015
Lab ID:	1509E14-01A	Matrix:	Liquid
Client Sample ID:	DOWNSTREAM	Site ID:	HALL - UIC

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
METALS BY ICP		Method: EPA 200.7 Rev. 4.4 (1994)				Analyst: CGW		
Aluminum	2.90	0.006	0.100	NA		mg/L	9/18/2015 6:20 PM	PAVA
Barium	0.132	0.002	0.100	NA		mg/L	9/18/2015 11:08 AM	PAVA
Calcium	38.6	0.050	1.00	NA		mg/L	9/18/2015 11:08 AM	PAVA
Iron	3.98	0.010	0.100	NA		mg/L	9/18/2015 11:08 AM	PAVA
Magnesium	6.92	0.050	0.500	NA		mg/L	9/18/2015 11:08 AM	PAVA
Manganese	0.151	0.002	0.100	NA		mg/L	9/18/2015 11:08 AM	PAVA
Potassium	4.64	0.050	0.500	NA		mg/L	9/18/2015 11:08 AM	PAVA
Sodium	13.8	0.100	1.00	NA		mg/L	9/18/2015 11:08 AM	PAVA
Strontium	0.286	0.001	0.010	NA		mg/L	9/17/2015 10:48 AM	

Notes:

Matrix spike recovery for Al does not meet laboratory control limits due to matrix interference. Recovery in the associated post-digestion spike meets laboratory control limits.

METALS BY ICP-MS		Method: EPA 200.8 Rev. 5.4 (1994)				Analyst: LF		
Arsenic	0.0022	0.0010	0.0050	NA	J	mg/L	9/15/2015 1:17 PM	PAVA
Lead	0.0030	0.0002	0.0010	NA		mg/L	9/15/2015 1:17 PM	PAVA

HARDNESS		Method: SM2340 B-1997				Analyst: CGW		
Hardness, Total (As CaCO ₃)	125	NA	1.00	NA		mg/L	9/18/2015 11:08 AM	VA

ANIONS by ION CHROMATOGRAPHY		Method: EPA 300.0, Rev.2.1 (1993)				Analyst: CF		
Bromide	ND	0.05	0.10	NA		mg/L	9/11/2015 4:40 PM	PAVA
Chloride	20.6	0.20	1.00	NA		mg/L	9/11/2015 4:40 PM	PAVA
Sulfate	18.1	1.00	5.00	NA		mg/L	9/11/2015 4:40 PM	PAVA

ANIONS by ION CHROMATOGRAPHY-48 HOUR		Method: EPA 300.0, Rev.2.1 (1993)				Analyst: CF		
Nitrogen, Nitrate	0.63	0.02	0.10	NA		mg/L	9/11/2015 4:40 PM	PAVA
Nitrogen, Nitrite	1.08	0.05	0.50	NA		mg/L	9/11/2015 4:40 PM	PAVA

CONDUCTIVITY		Method: SM2510 B - 1997				Analyst: KY		
Specific Conductivity	335	NA	NA	NA		µmhos/cm	9/14/2015 2:45 PM	PAVA

TOTAL DISSOLVED SOLIDS		Method: SM2540 C-1997				Analyst: KY		
Total Dissolved Solids	168	5	10	NA		mg/L	9/11/2015 5:08 PM	PAVA

REI Consultants, Inc. - Analytical Report**WO#: 1509E14****Date Reported: 9/30/2015**

Client:	WEST VIRGINIA DEP / OFFICE OF OIL & GAS	Collection Date:	9/10/2015 10:35:00 AM
Project:	STEAMS & DRAINS	Date Received:	9/11/2015
Lab ID:	1509E14-01A	Matrix:	Liquid
Client Sample ID:	DOWNSTREAM	Site ID:	HALL - UIC

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
TOTAL SUSPENDED SOLIDS								
				Method: SM2540 D-1997			Analyst: KY	
Total Suspended Solids	98.0	2.0	10	NA		mg/L	9/11/2015 4:48 PM	PAVA
ACIDITY								
				Method: SM2310 B-1997			Analyst: VS	
Acidity, Total	17.6	1.0	10	NA		mg/L	9/14/2015 4:50 PM	PAVA
ALKALINITY								
				Method: SM2320 B-1997			Analyst: VS	
Alkalinity, Total (As CaCO3)	96.5	1.0	20.0	NA		mg/L	9/14/2015 4:50 PM	PAVA
pH - LAB TEST, HOLD TIME EXPIRED								
				Method: SM4500-H+-B-2000			Analyst: VS	
pH	7.48	NA	NA	NA		SU	9/14/2015 4:50 PM	

REI Consultants, Inc. - Analytical Report

WO#: 1509E14

Date Reported: 9/30/2015

Client:	WEST VIRGINIA DEP / OFFICE OF OIL & GAS	Collection Date:	9/10/2015 11:25:00 AM
Project:	STEAMS & DRAINS	Date Received:	9/11/2015
Lab ID:	1509E14-02A	Matrix:	Liquid
Client Sample ID:	SAMPLE 2	Site ID:	HALL - UIC

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
METALS BY ICP								
			Method: EPA 200.7 Rev. 4.4 (1994)				Analyst: CGW	
Aluminum	2.68	0.006	0.100	NA		mg/L	9/18/2015 11:32 AM	PAVA
Barium	0.110	0.002	0.100	NA		mg/L	9/18/2015 11:32 AM	PAVA
Calcium	33.7	0.050	1.00	NA		mg/L	9/18/2015 11:32 AM	PAVA
Iron	3.60	0.010	0.100	NA		mg/L	9/18/2015 11:32 AM	PAVA
Magnesium	6.25	0.050	0.500	NA		mg/L	9/18/2015 11:32 AM	PAVA
Manganese	0.133	0.002	0.100	NA		mg/L	9/18/2015 11:32 AM	PAVA
Potassium	4.65	0.050	0.500	NA		mg/L	9/18/2015 11:32 AM	PAVA
Sodium	13.3	0.100	1.00	NA		mg/L	9/18/2015 11:32 AM	PAVA
Strontium	0.213	0.001	0.010	NA		mg/L	9/17/2015 11:03 AM	
METALS BY ICP-MS								
			Method: EPA 200.8 Rev. 5.4 (1994)				Analyst: LF	
Arsenic	0.0019	0.0010	0.0050	NA	J	mg/L	9/15/2015 1:23 PM	PAVA
Lead	0.0024	0.0002	0.0010	NA		mg/L	9/15/2015 1:23 PM	PAVA
HARDNESS								
			Method: SM2340 B-1997				Analyst: CGW	
Hardness, Total (As CaCO3)	110	NA	1.00	NA		mg/L	9/18/2015 11:32 AM	VA
ANIONS by ION CHROMATOGRAPHY								
			Method: EPA 300.0, Rev.2.1 (1993)				Analyst: CF	
Bromide	ND	0.05	0.10	NA		mg/L	9/11/2015 4:59 PM	PAVA
Chloride	17.6	0.20	1.00	NA		mg/L	9/11/2015 4:59 PM	PAVA
Sulfate	14.9	1.00	5.00	NA		mg/L	9/11/2015 4:59 PM	PAVA
ANIONS by ION CHROMATOGRAPHY-48 HOUR								
			Method: EPA 300.0, Rev.2.1 (1993)				Analyst: CF	
Nitrogen, Nitrate	0.56	0.02	0.10	NA		mg/L	9/11/2015 4:59 PM	PAVA
Nitrogen, Nitrite	1.05	0.05	0.50	NA		mg/L	9/11/2015 4:59 PM	PAVA
CONDUCTIVITY								
			Method: SM2510 B - 1997				Analyst: KY	
Specific Conductivity	312	NA	NA	NA		µmhos/cm	9/14/2015 2:45 PM	PAVA
TOTAL DISSOLVED SOLIDS								
			Method: SM2540 C-1997				Analyst: KY	
Total Dissolved Solids	164	5	10	NA		mg/L	9/11/2015 5:08 PM	PAVA
TOTAL SUSPENDED SOLIDS								
			Method: SM2540 D-1997				Analyst: KY	
Total Suspended Solids	55.0	2.0	10	NA		mg/L	9/11/2015 4:48 PM	PAVA

REI Consultants, Inc. - Analytical Report

WO#: 1509E14

Date Reported: 9/30/2015

Client:	WEST VIRGINIA DEP / OFFICE OF OIL & GAS	Collection Date:	9/10/2015 11:25:00 AM
Project:	STEAMS & DRAINS	Date Received:	9/11/2015
Lab ID:	1509E14-02A	Matrix:	Liquid
Client Sample ID:	SAMPLE 2	Site ID:	HALL - UIC

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
ACIDITY								
				Method: SM2310 B-1997			Analyst: VS	
Acidity, Total	14.2	1.0	10	NA		mg/L	9/14/2015 4:50 PM	PAVA
ALKALINITY								
				Method: SM2320 B-1997			Analyst: VS	
Alkalinity, Total (As CaCO ₃)	91.8	1.0	20.0	NA		mg/L	9/14/2015 4:50 PM	PAVA
pH - LAB TEST, HOLD TIME EXPIRED								
				Method: SM4500-H+-B-2000			Analyst: VS	
pH	7.28	NA	NA	NA		SU	9/14/2015 4:50 PM	

REI Consultants, Inc. - Analytical Report

WO#: 1509E14

Date Reported: 9/30/2015

Client:	WEST VIRGINIA DEP / OFFICE OF OIL & GAS	Collection Date:	9/10/2015 11:45:00 AM
Project:	STEAMS & DRAINS	Date Received:	9/11/2015
Lab ID:	1509E14-03A	Matrix:	Liquid
Client Sample ID:	SAMPLE 3	Site ID:	HALL - UIC

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
METALS BY ICP								
			Method: EPA 200.7 Rev. 4.4 (1994)				Analyst: CGW	
Aluminum	0.731	0.006	0.100	NA		mg/L	9/18/2015 11:38 AM	PAVA
Barium	0.153	0.002	0.100	NA		mg/L	9/18/2015 11:38 AM	PAVA
Calcium	67.0	0.050	1.00	NA		mg/L	9/18/2015 11:38 AM	PAVA
Iron	0.938	0.010	0.100	NA		mg/L	9/18/2015 11:38 AM	PAVA
Magnesium	12.3	0.050	0.500	NA		mg/L	9/18/2015 11:38 AM	PAVA
Manganese	0.147	0.002	0.100	NA		mg/L	9/18/2015 11:38 AM	PAVA
Potassium	3.90	0.050	0.500	NA		mg/L	9/18/2015 11:38 AM	PAVA
Sodium	19.3	0.100	1.00	NA		mg/L	9/18/2015 11:38 AM	PAVA
Strontium	0.763	0.001	0.010	NA		mg/L	9/17/2015 11:06 AM	
METALS BY ICP-MS								
			Method: EPA 200.8 Rev. 5.4 (1994)				Analyst: LF	
Arsenic	ND	0.0010	0.0050	NA		mg/L	9/15/2015 1:28 PM	PAVA
Lead	0.0009	0.0002	0.0010	NA	J	mg/L	9/15/2015 1:28 PM	PAVA
HARDNESS								
			Method: SM2340 B-1997				Analyst: CGW	
Hardness, Total (As CaCO3)	218	NA	1.00	NA		mg/L	9/18/2015 11:38 AM	VA
ANIONS by ION CHROMATOGRAPHY								
			Method: EPA 300.0, Rev.2.1 (1993)				Analyst: CF	
Bromide	0.24	0.05	0.10	NA		mg/L	9/11/2015 5:18 PM	PAVA
Chloride	47.3	0.20	1.00	NA		mg/L	9/11/2015 5:18 PM	PAVA
Sulfate	43.3	1.00	5.00	NA		mg/L	9/11/2015 5:18 PM	PAVA
ANIONS by ION CHROMATOGRAPHY-48 HOUR								
			Method: EPA 300.0, Rev.2.1 (1993)				Analyst: CF	
Nitrogen, Nitrate	1.09	0.02	0.10	NA		mg/L	9/11/2015 5:18 PM	PAVA
Nitrogen, Nitrite	1.35	0.05	0.50	NA		mg/L	9/11/2015 5:18 PM	PAVA
CONDUCTIVITY								
			Method: SM2510 B - 1997				Analyst: KY	
Specific Conductivity	572	NA	NA	NA		µmhos/cm	9/14/2015 2:45 PM	PAVA
TOTAL DISSOLVED SOLIDS								
			Method: SM2540 C-1997				Analyst: KY	
Total Dissolved Solids	286	5	10	NA		mg/L	9/11/2015 5:08 PM	PAVA
TOTAL SUSPENDED SOLIDS								
			Method: SM2540 D-1997				Analyst: KY	
Total Suspended Solids	29.0	2.0	10	NA		mg/L	9/11/2015 4:48 PM	PAVA

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WO#: 1509E14

Date Reported: 9/30/2015

Client:	WEST VIRGINIA DEP / OFFICE OF OIL & GAS	Collection Date:	9/10/2015 11:45:00 AM
Project:	STEAMS & DRAINS	Date Received:	9/11/2015
Lab ID:	1509E14-03A	Matrix:	Liquid
Client Sample ID:	SAMPLE 3	Site ID:	HALL - UIC

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
ACIDITY								
				Method: SM2310 B-1997			Analyst: VS	
Acidity, Total	2.1	1.0	10	NA	J	mg/L	9/14/2015 4:50 PM	PAVA
ALKALINITY								
				Method: SM2320 B-1997			Analyst: VS	
Alkalinity, Total (As CaCO3)	138	1.0	20.0	NA		mg/L	9/14/2015 4:50 PM	PAVA
pH - LAB TEST, HOLD TIME EXPIRED								
				Method: SM4500-H+-B-2000			Analyst: VS	
pH	7.86	NA	NA	NA		SU	9/14/2015 4:50 PM	

REI Consultants, Inc. - Analytical Report

WO#: 1509E14

Date Reported: 9/30/2015

Client:	WEST VIRGINIA DEP / OFFICE OF OIL & GAS	Collection Date:	9/10/2015 12:00:00 PM
Project:	STEAMS & DRAINS	Date Received:	9/11/2015
Lab ID:	1509E14-04A	Matrix:	Liquid
Client Sample ID:	SAMPLE 4	Site ID:	HALL - UIC

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
METALS BY ICP								
			Method: EPA 200.7 Rev. 4.4 (1994)				Analyst: CGW	
Aluminum	1.40	0.006	0.100	NA		mg/L	9/18/2015 11:44 AM	PAVA
Barium	1.34	0.002	0.100	NA		mg/L	9/18/2015 11:44 AM	PAVA
Calcium	173	0.050	1.00	NA	E	mg/L	9/18/2015 11:44 AM	PAVA
Iron	1.23	0.010	0.100	NA		mg/L	9/18/2015 11:44 AM	PAVA
Magnesium	55.9	0.050	0.500	NA	E	mg/L	9/18/2015 11:44 AM	PAVA
Manganese	13.8	0.002	0.100	NA	E	mg/L	9/18/2015 11:44 AM	PAVA
Potassium	8.61	0.050	0.500	NA		mg/L	9/18/2015 11:44 AM	PAVA
Sodium	350	10.0	100	NA		mg/L	9/18/2015 11:56 AM	PAVA
Strontium	15.3	0.010	0.100	NA	E	mg/L	9/21/2015 10:18 AM	
METALS BY ICP-MS								
			Method: EPA 200.8 Rev. 5.4 (1994)				Analyst: LF	
Arsenic	ND	0.0010	0.0050	NA		mg/L	9/15/2015 1:34 PM	PAVA
Lead	0.0023	0.0002	0.0010	NA		mg/L	9/15/2015 1:34 PM	PAVA
HARDNESS								
			Method: SM2340 B-1997				Analyst: CGW	
Hardness, Total (As CaCO ₃)	661	NA	1.00	NA		mg/L	9/18/2015 11:44 AM	VA
ANIONS by ION CHROMATOGRAPHY								
			Method: EPA 300.0, Rev.2.1 (1993)				Analyst: CF	
Bromide	12.5	2.50	5.00	NA		mg/L	9/14/2015 9:26 AM	PAVA
Chloride	938	10.0	50.0	NA		mg/L	9/14/2015 9:26 AM	PAVA
Sulfate	5.24	1.00	5.00	NA		mg/L	9/11/2015 5:37 PM	PAVA
ANIONS by ION CHROMATOGRAPHY-48 HOUR								
			Method: EPA 300.0, Rev.2.1 (1993)				Analyst: CF	
Nitrogen, Nitrate	2.76	0.10	0.50	NA	H	mg/L	9/14/2015 10:06 AM	PAVA
Nitrogen, Nitrite	ND	0.05	0.50	NA		mg/L	9/11/2015 5:37 PM	PAVA
CONDUCTIVITY								
			Method: SM2510 B - 1997				Analyst: KY	
Specific Conductivity	3,270	NA	NA	NA		µmhos/cm	9/14/2015 2:45 PM	PAVA
TOTAL DISSOLVED SOLIDS								
			Method: SM2540 C-1997				Analyst: KY	
Total Dissolved Solids	2,390	5	10	NA		mg/L	9/11/2015 5:08 PM	PAVA
TOTAL SUSPENDED SOLIDS								
			Method: SM2540 D-1997				Analyst: KY	
Total Suspended Solids	116	2.0	10	NA		mg/L	9/11/2015 4:48 PM	PAVA

REI Consultants, Inc. - Analytical Report**WO#: 1509E14****Date Reported: 9/30/2015**

Client:	WEST VIRGINIA DEP / OFFICE OF OIL & GAS	Collection Date:	9/10/2015 12:00:00 PM
Project:	STEAMS & DRAINS	Date Received:	9/11/2015
Lab ID:	1509E14-04A	Matrix:	Liquid
Client Sample ID:	SAMPLE 4	Site ID:	HALL - UIC

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
ACIDITY								
				Method: SM2310 B-1997			Analyst: VS	
Acidity, Total	73.2	1.0	10	NA		mg/L	9/14/2015 4:50 PM	PAVA
ALKALINITY								
				Method: SM2320 B-1997			Analyst: VS	
Alkalinity, Total (As CaCO3)	ND	1.0	20.0	NA		mg/L	9/14/2015 4:50 PM	PAVA
pH - LAB TEST, HOLD TIME EXPIRED								
				Method: SM4500-H+-B-2000			Analyst: VS	
pH	4.02	NA	NA	NA		SU	9/14/2015 4:50 PM	

REI Consultants, Inc. - Analytical Report

WO#: 1509E14

Date Reported: 9/30/2015

Client:	WEST VIRGINIA DEP / OFFICE OF OIL & GAS	Collection Date:	9/10/2015 1:05:00 PM
Project:	STEAMS & DRAINS	Date Received:	9/11/2015
Lab ID:	1509E14-05A	Matrix:	Liquid
Client Sample ID:	SAMPLE 5	Site ID:	HALL - UIC

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
METALS BY ICP								
			Method: EPA 200.7 Rev. 4.4 (1994)				Analyst: CGW	
Aluminum	1.06	0.006	0.100	NA		mg/L	9/18/2015 11:50 AM	PAVA
Barium	0.080	0.002	0.100	NA	J	mg/L	9/18/2015 11:50 AM	PAVA
Calcium	42.6	0.050	1.00	NA		mg/L	9/18/2015 11:50 AM	PAVA
Iron	1.46	0.010	0.100	NA		mg/L	9/18/2015 11:50 AM	PAVA
Magnesium	7.46	0.050	0.500	NA		mg/L	9/18/2015 11:50 AM	PAVA
Manganese	0.070	0.002	0.100	NA	J	mg/L	9/18/2015 11:50 AM	PAVA
Potassium	4.99	0.050	0.500	NA		mg/L	9/18/2015 11:50 AM	PAVA
Sodium	18.2	0.100	1.00	NA		mg/L	9/18/2015 11:50 AM	PAVA
Strontium	0.200	0.001	0.010	NA		mg/L	9/17/2015 11:12 AM	
METALS BY ICP-MS								
			Method: EPA 200.8 Rev. 5.4 (1994)				Analyst: LF	
Arsenic	0.0025	0.0010	0.0050	NA	J	mg/L	9/15/2015 1:40 PM	PAVA
Lead	0.0021	0.0002	0.0010	NA		mg/L	9/15/2015 1:40 PM	PAVA
HARDNESS								
			Method: SM2340 B-1997				Analyst: CGW	
Hardness, Total (As CaCO3)	137	NA	1.00	NA		mg/L	9/18/2015 11:50 AM	VA
ANIONS by ION CHROMATOGRAPHY								
			Method: EPA 300.0, Rev.2.1 (1993)				Analyst: CF	
Bromide	ND	0.05	0.10	NA		mg/L	9/11/2015 5:56 PM	PAVA
Chloride	25.2	0.20	1.00	NA		mg/L	9/11/2015 5:56 PM	PAVA
Sulfate	16.0	1.00	5.00	NA		mg/L	9/11/2015 5:56 PM	PAVA
ANIONS by ION CHROMATOGRAPHY-48 HOUR								
			Method: EPA 300.0, Rev.2.1 (1993)				Analyst: CF	
Nitrogen, Nitrate	0.58	0.02	0.10	NA		mg/L	9/11/2015 5:56 PM	PAVA
Nitrogen, Nitrite	1.26	0.05	0.50	NA		mg/L	9/11/2015 5:56 PM	PAVA
CONDUCTIVITY								
			Method: SM2510 B - 1997				Analyst: KY	
Specific Conductivity	399	NA	NA	NA		µmhos/cm	9/14/2015 2:45 PM	PAVA
TOTAL DISSOLVED SOLIDS								
			Method: SM2540 C-1997				Analyst: KY	
Total Dissolved Solids	193	5	10	NA		mg/L	9/11/2015 5:08 PM	PAVA
TOTAL SUSPENDED SOLIDS								
			Method: SM2540 D-1997				Analyst: KY	
Total Suspended Solids	18.0	2.0	10	NA		mg/L	9/11/2015 4:48 PM	PAVA

REI Consultants, Inc. - Analytical Report**WO#: 1509E14****Date Reported: 9/30/2015**

Client:	WEST VIRGINIA DEP / OFFICE OF OIL & GAS	Collection Date:	9/10/2015 1:05:00 PM
Project:	STEAMS & DRAINS	Date Received:	9/11/2015
Lab ID:	1509E14-05A	Matrix:	Liquid
Client Sample ID:	SAMPLE 5	Site ID:	HALL - UIC

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
ACIDITY								
				Method: SM2310 B-1997			Analyst: VS	
Acidity, Total	2.4	1.0	10	NA	J	mg/L	9/14/2015 4:50 PM	PAVA
ALKALINITY								
				Method: SM2320 B-1997			Analyst: VS	
Alkalinity, Total (As CaCO ₃)	119	1.0	20.0	NA		mg/L	9/14/2015 4:50 PM	PAVA
pH - LAB TEST, HOLD TIME EXPIRED								
				Method: SM4500-H+-B-2000			Analyst: VS	
pH	7.35	NA	NA	NA		SU	9/14/2015 4:50 PM	

September 30, 2015

Ms. Stacy Heasley
REI Consultants, Inc.
225 Industrial Park Drive
PO Box 286
Beaver, WV 25813

RE: Project: 1509E14
Pace Project No.: 30159379

Dear Ms. Heasley:

Enclosed are the analytical results for sample(s) received by the laboratory on September 16, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Carin Ferris
carin.ferris@pacelabs.com
Project Manager

Enclosures



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 1509E14
Pace Project No.: 30159379

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42708
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 1509E14
Pace Project No.: 30159379

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30159379001	1509E14-01A	Water	09/10/15 10:35	09/16/15 10:30
30159379002	1509E14-02A	Water	09/10/15 11:25	09/16/15 10:30
30159379003	1509E14-03A	Water	09/10/15 11:45	09/16/15 10:30
30159379004	1509E14-04A	Water	09/10/15 12:00	09/16/15 10:30
30159379005	1509E14-05A	Water	09/10/15 13:05	09/16/15 10:30

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 1509E14
Pace Project No.: 30159379

Lab ID	Sample ID	Method	Analysts	Analytes Reported
30159379001	1509E14-01A	EPA 903.1	WRR	1
		EPA 904.0	JLW	1
30159379002	1509E14-02A	EPA 903.1	WRR	1
		EPA 904.0	JLW	1
30159379003	1509E14-03A	EPA 903.1	WRR	1
		EPA 904.0	JLW	1
30159379004	1509E14-04A	EPA 903.1	WRR	1
		EPA 904.0	JLW	1
30159379005	1509E14-05A	EPA 903.1	WRR	1
		EPA 904.0	JLW	1

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: 1509E14
Pace Project No.: 30159379

Method: EPA 903.1
Description: 903.1 Radium 226
Client: REI Consultants, Inc.
Date: September 30, 2015

General Information:

5 samples were analyzed for EPA 903.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: 1509E14
Pace Project No.: 30159379

Method: EPA 904.0
Description: 904.0 Radium 228
Client: REI Consultants, Inc.
Date: September 30, 2015

General Information:

5 samples were analyzed for EPA 904.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 1509E14
Pace Project No.: 30159379

Sample: 1509E14-01A Lab ID: 30159379001 Collected: 09/10/15 10:35 Received: 09/16/15 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample Acceptance Policy Waiver on file from the client.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	2.74 ± 4.31 (6.15) C:NA T:93%	pCi/L	09/30/15 10:08	13982-63-3	
Radium-228	EPA 904.0	7.28 ± 3.37 (5.79) C:94% T:75%	pCi/L	09/29/15 16:04	15262-20-1	

Sample: 1509E14-02A Lab ID: 30159379002 Collected: 09/10/15 11:25 Received: 09/16/15 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample Acceptance Policy Waiver on file from the client.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.611 ± 3.39 (5.32) C:NA T:93%	pCi/L	09/30/15 10:12	13982-63-3	
Radium-228	EPA 904.0	5.17 ± 3.53 (6.86) C:93% T:79%	pCi/L	09/29/15 16:04	15262-20-1	

Sample: 1509E14-03A Lab ID: 30159379003 Collected: 09/10/15 11:45 Received: 09/16/15 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample Acceptance Policy Waiver on file from the client.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	1.99 ± 3.91 (5.78) C:NA T:90%	pCi/L	09/30/15 10:12	13982-63-3	
Radium-228	EPA 904.0	5.59 ± 3.27 (6.14) C:94% T:79%	pCi/L	09/29/15 16:04	15262-20-1	

Sample: 1509E14-04A Lab ID: 30159379004 Collected: 09/10/15 12:00 Received: 09/16/15 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample Acceptance Policy Waiver on file from the client.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	2.38 ± 3.31 (4.72) C:NA T:92%	pCi/L	09/30/15 10:19	13982-63-3	
Radium-228	EPA 904.0	7.89 ± 3.25 (5.35) C:91% T:87%	pCi/L	09/29/15 16:04	15262-20-1	

Sample: 1509E14-05A Lab ID: 30159379005 Collected: 09/10/15 13:05 Received: 09/16/15 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample Acceptance Policy Waiver on file from the client.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	3.58 ± 4.07 (5.61) C:NA T:91%	pCi/L	09/30/15 10:29	13982-63-3	
Radium-228	EPA 904.0	9.53 ± 3.95 (6.68) C:99% T:71%	pCi/L	09/29/15 15:54	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 1509E14
Pace Project No.: 30159379

QC Batch:	RADC/26081	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	30159379001, 30159379002, 30159379003, 30159379004, 30159379005		

METHOD BLANK:	953467	Matrix:	Water
Associated Lab Samples:	30159379001, 30159379002, 30159379003, 30159379004, 30159379005		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.202 ± 0.338 (0.737) C:92% T:81%	pCi/L	09/29/15 12:26	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 1509E14
Pace Project No.: 30159379

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

REPORT OF LABORATORY ANALYSIS

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CHAIN OF CUSTODY RECORD

COC ID: 6806

PAGE: 1

OF: 1

ADDRESS
REI Consultants, Inc.
 PO Box 286
 Beaver, WV 25813
 TEL: (304) 255-2500
 FAX: (304) 255-2572
 Website: www.reicons.com

Improving the environment, one client at a time...

Please Include Email Address of Report Recipient Whenever Possible!!!

SUB CONTRACTOR		PACE_PA		COMPANY	PACE ANALYTICAL SERVICE	
ADDRESS		1638 ROSEY TOWN ROAD				
CITY STATE ZIP		GREENSBURG, PA 15601				
PHONE		(724) 850-5600				
FAX						
E-MAIL		050719EVF1				

SAMPLE ID	CONTAINER ID	DATE COLLECTED	MATRIX	ANALYTICAL PARAMETERS	COMMENTS
1	1509E14-01A	DOWNSTREAM	Liquid	0.0000	
2	1509E14-02A	SAMPLE 2	Liquid	0.002	
3	1509E14-03A	SAMPLE 3	Liquid	0.003	
4	1509E14-04A	SAMPLE 4	Liquid	0.004	
5	1509E14-05A	SAMPLE 5	Liquid	0.005	

30159379

22 00 002 003 004 005

SUBMITTED BY		DATE		TIME		RECEIVED BY		DATE		TIME	
Whitney Williams		9/14/15		16:00		UPS		9/14/15		10:00	
LABORATORY		DATE		TIME		RECEIVED BY		DATE		TIME	
Pace Analytical		9/14/15		10:00		Pace Analytical		9/14/15		10:00	
TAX		DATE		TIME		TAX		DATE		TIME	

*Results by 9/14/15 Thank you



Sample Condition Upon Receipt

Client Name: REICProject # 30159379Courier: ☐ Fed Ex ☒ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____Tracking #: 1226x7130376507450Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals Intact: ☐ yes ☐ no Biological Tissue Is Frozen: Yes NoPacking Material: Bubble Wrap Bubble Bags _____ None _____ Other _____Thermometer Used NA Type of Ice: Wet Blue None ☐ Samples on ice, cooling process has begunCooler Temp.: Observed Temp.: NA °C Correction Factor: _____ °C Final Temp: _____ °C

Date and Initials of person

examining contents: AMH
9/17/15

Temp should be above freezing to 8°C

Comments:

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8. <u>low volume</u>
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes date/time/ID/Analysis Matrix:	<u>WT</u>	
All containers needing preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>PHCZ</u>
exceptions: VOA, coliform, TOC, O&G, Phenols	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Initial when completed <u>AMH</u> Lot # of added preservative
Samples checked for dechlorination:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Headspace in VOA Vials (>8mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	16.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution:

Field Data Required?

Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Carino SerranoDate: 9/17/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

30159379

REL

[illegible]



west virginia department of environmental protection

Office of Oil and Gas
601 57th Street, S.E.
Charleston, WV 25304
Phone: (304) 926-0450; Fax: (304) 926-0452

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

October 19, 2015

Site Visit – Storm Water Runoff Sample Collection
Hall Drilling, LLC – Tech Service Center
UIC Facility Permit No. 2D0859669
Lamberton, Richie County, WV
September 10, 2015 10:44-13:30

WVDEP Personnel On-Site:

T. Bass– WVDEP-OOG
A. Lockwood – WVDEP-OOG
J. King – WVDEP-Environmental Advocate

Hall Drilling Personnel On-Site:

Jason Hall – Manager, Hall Drilling, LLC

Site Conditions:

Temp: 73° F, Wind: 5 mph NNW, Overcast.

Rainfall: 0.91 inches in previous 24 hours.

All ditchlines and streams were running at moderate levels with cloudy and turbid discharge reflecting recent rains.

Field Narrative

Personnel from the WVDEP-Office of Oil & Gas visited the Hall Drilling, LLC– Tech Service Center on September 10, 2015 to collect water samples from surface drainage locations on-site and from Hushers Run located off-site south of the facility. WVDEP Environmental Advocate, J. King, observed the sampling activities and toured the facility in order to familiarize himself with the operation. The purpose of the sample collection was to assess the water quality conditions after a typical rainfall/runoff event. As noted above, the area had recently experienced 24 hours of steady rain (0.91 in.) and the ground surface was wet and saturated with all ditchlines and streams running at moderate levels.

Sample locations were chosen so that the contributions of various tributaries to Hushers Run that drain the Hall facility could be assessed. Sample No. 1, No. 2, and No. 5 were located on the main stem of Hushers Run. Sample No.1 was collected

Promoting a healthy environment.

downstream of the tributary that drains the center of the Hall facility. The flow at this point was moderate with a milky and turbid character.



Hushers Run Sample Point No. 1 – Downstream of center tributary

Sample No. 2 was collected downstream of the confluence of the tributary that drains the east side of the Hall facility. The flow at this point was also moderate with a milky and turbid character.



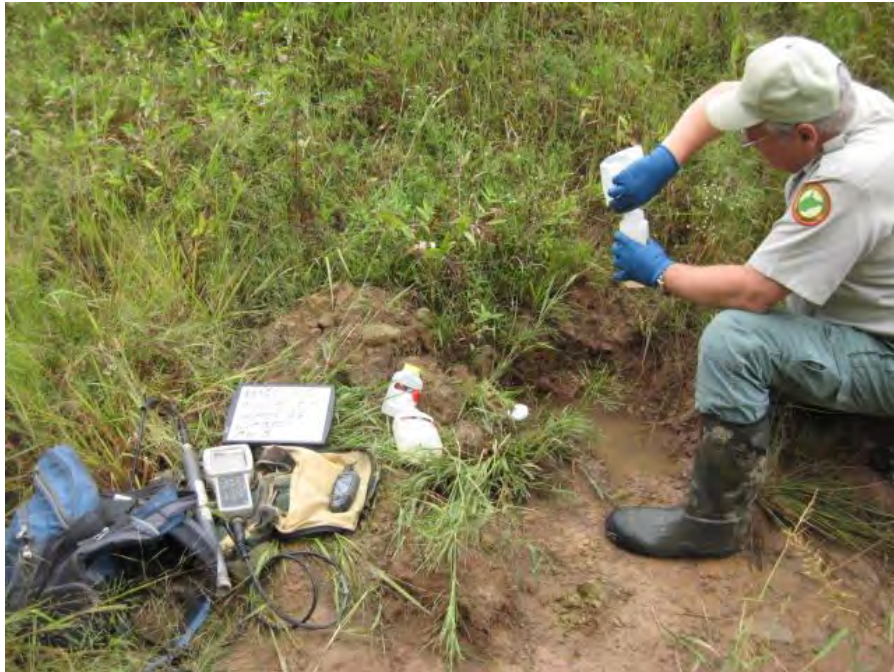
Hushers Run Sample Point No. 2 – Downstream of east tributary

Sample No. 3 was collected from the center tributary just north of the guardhouse at the entrance to the Hall facility. The flow was moderate and was clear to slightly turbid.



Sample Point No. 3 – center tributary

Sample No.4 was collected from a small seep approximately 50 feet east and downslope from Monitoring Well No.3 (MW-3) located at the west side of the west holding pit. During a previous site visit, a shallow sump was dug at the location of the seep in order to allow sufficient water to collect for sampling purposes. At the time of this visit, the sump was full and clear and recharged at a rapid rate after sample extraction.



Sample Point No.4 - Sump below Monitoring Well No.3

Sample No. 5 was collected upstream of the confluence of the east tributary that drains the east side of the complex. The flow upstream at this point was moderate and was clear to slightly turbid.



Hushers Run Sample Point No.5 – Upstream of east tributary

All samples were collected according to standard protocols including chain of custody documentation and refrigerated storage. The samples were delivered under seal to REIC laboratory in Beckley, West Virginia by Thomas L. Bass early on Friday, September 11, 2015.

WVDEP personnel toured the site with Jason Hall, Manager of the facility. All three groundwater monitoring wells were in good condition with locked caps.



Monitoring Well No. 1 (facing south)



Monitoring Well No. 2 (facing northwest)



Monitoring Well No. 3 (at left, facing south)

Field measurements of conductivity, temperature, pH, and GPS location were collected at each sample location. GPS locations were corrected using photos and Google Earth. Sample site locations are shown in Figure 1. Analytical data is summarized in Figure 2. Analytical results are attached as Appendix 1. Site photographs and a photo log are attached to this report as Appendix 2.

Prepared by:
Andrew L. Lockwood
Permitting Geologist
WVDEP-OOG

Hall Drilling, LLC**UIC Facility Permit No. 2D0859669****Photo Log****September 10, 2015**

Photo No.	Description
HallUIC_9-10-15_01	Marker Board - Hushers Run Downstream, 9-10-15
HallUIC_9-10-15_02	Sample Site No.1, Hushers Run, facing east, upstream
HallUIC_9-10-15_03	Sample Site No.1, Hushers Run
HallUIC_9-10-15_04	Sample Site No.1, Hushers Run, facing west, downstream
HallUIC_9-10-15_05	Sample Site No.1, Hushers Run, facing east, upstream
HallUIC_9-10-15_06	Sample Site No.1, Hushers Run, facing east, upstream
HallUIC_9-10-15_07	Sample Site No.1, Hushers Run, facing north
HallUIC_9-10-15_08	Culvert exit, from center tributary, facing north
HallUIC_9-10-15_09	Culvert entrance, from center tributary, facing south, panorama 1 of 5
HallUIC_9-10-15_10	Culvert entrance, from center tributary, facing south, panorama 2 of 5
HallUIC_9-10-15_11	Culvert entrance, from center tributary, facing south, panorama 3 of 5
HallUIC_9-10-15_12	Culvert entrance, from center tributary, facing south, panorama 4 of 5
HallUIC_9-10-15_13	Culvert entrance, from center tributary, facing south, panorama 5 of 5
HallUIC_9-10-15_14	Marker Board - Sample Site No.2, Hushers Run Midway, 9-10-15
HallUIC_9-10-15_15	Sample Site No.2, facing south
HallUIC_9-10-15_16	Sample Site No.2, panorama 1 of 3, north to east
HallUIC_9-10-15_17	Sample Site No.2, panorama 2 of 3, north to east
HallUIC_9-10-15_18	Sample Site No.2, panorama 3 of 3, north to east
HallUIC_9-10-15_19	Sample Site No.2, facing west downstream
HallUIC_9-10-15_20	Lamberton Rd., panorama 1 of 2, facing east
HallUIC_9-10-15_21	Lamberton Rd., panorama 2 of 2, facing east
HallUIC_9-10-15_22	Marker Board - Sample Site No.3, east side ditch, center tributary, facing north
HallUIC_9-10-15_23	Sample Site No.3, center tributary at guard shack, facing north
HallUIC_9-10-15_24	Guard shack area, facing south
HallUIC_9-10-15_25	West holding pit, panorama 1 of 3, facing south
HallUIC_9-10-15_26	West holding pit, panorama 2 of 3, facing south
HallUIC_9-10-15_27	West holding pit, panorama 3 of 3, facing south
HallUIC_9-10-15_28	Marker Board - Sample Site No.4, sump below MW-3, 9-10-15
HallUIC_9-10-15_29	Sample Site No.4, at MW-3, facing south
HallUIC_9-10-15_30	Sample Site No.4, at MW-3, facing north
HallUIC_9-10-15_31	Sample Site No.4, at MW-3
HallUIC_9-10-15_32	Sample Site No.4, at MW-3, panorama 1 of 4, east to south
HallUIC_9-10-15_33	Sample Site No.4, at MW-3, panorama 2 of 4, east to south
HallUIC_9-10-15_34	Sample Site No.4, at MW-3, panorama 3 of 4, east to south
HallUIC_9-10-15_35	Sample Site No.4, at MW-3, panorama 4 of 4, east to south
HallUIC_9-10-15_36	Skimmer storage tank, facing south
HallUIC_9-10-15_37	East holding pit, facing south, panorama 1 of 3
HallUIC_9-10-15_38	East holding pit, facing south, panorama 2 of 3
HallUIC_9-10-15_39	East holding pit, facing south, panorama 3 of 3

HallUIC_9-10-15_40	East holding pit, facing west, panorama 1 of 3
HallUIC_9-10-15_41	East holding pit, facing west, panorama 2 of 3
HallUIC_9-10-15_42	East holding pit, facing west, panorama 3 of 3
HallUIC_9-10-15_43	Oil skimmer boom at east holding pit
HallUIC_9-10-15_44	Monitoring well No. 1 (MW-1), facing south
HallUIC_9-10-15_45	East holding pit, facing north, panorama 1 of 3
HallUIC_9-10-15_46	East holding pit, facing north, panorama 2 of 3
HallUIC_9-10-15_47	East holding pit, facing north, panorama 3 of 3
HallUIC_9-10-15_48	Monitoring well No. 2 (MW-2), facing north, panorama 1 of 3
HallUIC_9-10-15_49	Monitoring well No. 2 (MW-2), facing north, panorama 2 of 3
HallUIC_9-10-15_50	Monitoring well No. 2 (MW-2), facing north, panorama 3 of 3
HallUIC_9-10-15_51	Monitoring well No. 2 (MW-2), facing south, panorama 1 of 2
HallUIC_9-10-15_52	Monitoring well No. 2 (MW-2), facing south, panorama 2 of 2
HallUIC_9-10-15_53	API tag at active injection well, API 085-09909
HallUIC_9-10-15_54	Injection well, tubing pressure gauge
HallUIC_9-10-15_55	Injection well, annular pressure gauge
HallUIC_9-10-15_56	Injection well and security fence
HallUIC_9-10-15_57	Injection well and security fence
HallUIC_9-10-15_58	Culvert under Lamberton Rd. carrying east tributary, facing north, panorama 1 of 2
HallUIC_9-10-15_59	Culvert under Lamberton Rd. carrying east tributary, facing north, panorama 2 of 2
HallUIC_9-10-15_60	Marker Board - Sample Site No.5, Hushers Run, upstream of east tributary, 9-10-15
HallUIC_9-10-15_61	Sample Site No.5, Hushers Run, upstream of east tributary
HallUIC_9-10-15_62	Sample Site No.5, Hushers Run, upstream of east tributary

HALL VIC
9/10/15
HUSHERS
RUN
DOWNSTREAM



LOC
11/19/15
HUSHERS RUN
Dennis Egan





















HALC UIC
9110/15

10:25

Midway

HR #2















HALC UIC

9/10/15

SAMPLE #3

EAST SIDE DITCH











HACC UIC

9/10/15 12:00

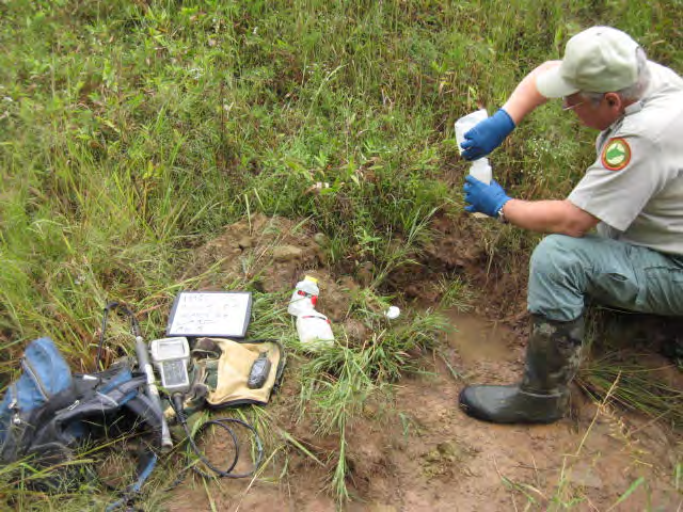
SAMPLE #4

SUMP BELOW

MW-3

















CRUDE OIL

NO
PARKING
ANYTIME

























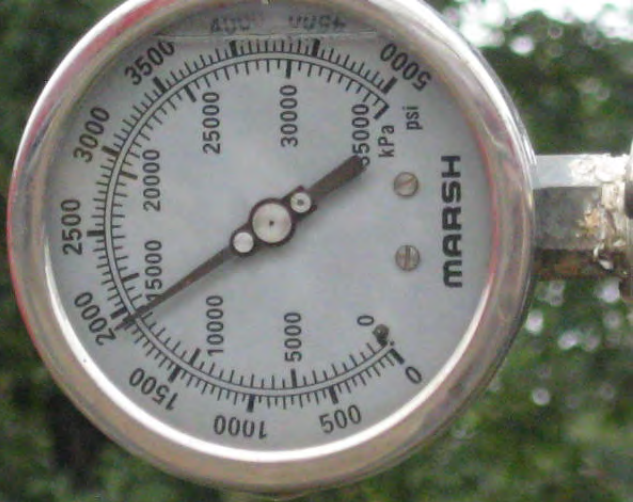








HALL DRILLING
TECH SERVICE CTR 3H
API 085-09909













Hall VIC
9/10/15 13:05
SAMPLE #5
HUSNERS RUN
US



